

Message

From: Matt Tonkin [matt@sspa.com]
Sent: 8/31/2018 2:20:37 AM
To: Whittier, Robert [Robert.Whittier@doh.hawaii.gov]; Grange, Gabrielle Fenix [gabrielle.grange@doh.hawaii.gov]; TU, LYNDSEY [Tu.Lyndsey@epa.gov]; G D Beckett [g.d.beckett@aquiver.com]
CC: Donald Thomas [dthomas@soest.hawaii.edu]
Subject: RE: Next Steps & Coord Calls

I believe that is what is referred to as a "significant event"!

Matthew J. Tonkin
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From: Whittier, Robert <Robert.Whittier@doh.hawaii.gov>
Sent: Thursday, August 30, 2018 5:17 PM
To: Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>; Matt Tonkin <matt@sspa.com>; TU, LYNDSEY <Tu.Lyndsey@epa.gov>; G D Beckett <g.d.beckett@aquiver.com>
Cc: Donald Thomas <dthomas@soest.hawaii.edu>
Subject: Re: Next Steps & Coord Calls

Hi All,

Here is a graph of the rain here at the office. The weather station is a cheap Costo unit, so I do need to do some correction. But we did get significant rain Monday and Tuesday Morning. I expect Red Hill got similar.

Thanks,

Bob W.

From: Grange, Gabrielle Fenix
Sent: Thursday, August 30, 2018 9:26:43 AM
To: Matt Tonkin; TU, LYNDSEY; Whittier, Robert; G D Beckett
Cc: Donald Thomas
Subject: RE: Next Steps & Coord Calls

Reading through the email chains now and looking forward to this discussion. Maybe best to do cover letter after we have the detailed SME comments? Useful to have a succinct summary that targets the key SME issues.

Lyndsey, if you have a moment before the call, let's check in.

Thanks!

Fenix

From: Matt Tonkin <matt@sspa.com>

Sent: Wednesday, August 29, 2018 11:03 AM

To: TU, LYNDSEY <TU.Lyndsey@epa.gov>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; G D Beckett <g.d.beckett@aquiver.com>

Cc: Donald Thomas <dthomas@soest.hawaii.edu>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>

Subject: RE: Next Steps & Coord Calls

Lyndsey:

Some quick responses below from my standpoint on each item.

1. We discussed the dip and strike, and they showed us tables, but we didn't receive their measurements in electronic format. We did get them in hard-copy format, though, which I think is fine. They also told us verbally the result of their own geostatistical analysis, which was remarkably close to ours. So, we have a lot of the info: they just need to do a thorough analysis of it, and come up with an appropriately weighted average to use in the model, and then ideally develop the new grid accordingly.
2. Yes
3. Yes, but also defer to Don's and Bob's input here. There is going to be a little trial-and-error as they incorporate this in the model.
4. Yes, I think this summary of fast-track features, and of all the geological units, applies to both the LNAPL F&T and groundwater F&T. Essentially, it is needed to underpin the CSM and enable the CSM narrative to be translated into inputs for predictive F&T calculations whether in vadose or GW, LNAPL or dissolved. [and we have provided the lava tube code]
5. Yes, this is correct. Given that the Navy documents suggest (see Bob's comments) that the water levels indicate preferential gradients/flow to this end of the tunnel, then the calibration process should be able to elucidate this via improved calibration statistics and improved general correspondence to mapped patterns, etc. As a result, one would perhaps weight a model including this feature intersecting Red Hill second tunnel higher than one excluding it, if one were to use a generalized likelihood type of framework for combining the results of their multi-model analysis.
6. Yes, and I think we have to defer to a technical call with the Navy group once they have the new grid, structure, etc together to settle on a reasonable way to weight the different models. I am including the attached as one recent article on the GLUE method. This is not the method the Navy is using, nor would I prescribe that they should – but, it is an appealing approach because it is a little more forgiving than probabilistic or true Bayesian methods, and provides a framework for working with multi-models via the “generalized” likelihood. This could be a topic to tackle on a technical call when the time is right. [and we provided the EXCEL file illustrating how we compared the multiple model results to the synoptic data]
7. Yes, I defer to Gary for this but will provide my 2-cents - a lot of good discussion was held on this topic in terms of detection monitoring, and that is really a longer-term commitment and consideration. However, I am not sure that the Navy fully grasped the other aspect of these data however, which was the information content of these data in terms of F&T in the vadose zone for both LNAPL and vapors. This is an important topic for the transport elements coming next year, so I am not sure there is immediate action on this, except to recognize and

acknowledge it, and then consider how it can help inform LNAPL/vapor F&T evaluations in that phase of the work.

8. Yes, I defer to Gary for this but again will provide my 2-cents – I thought the graphics Gary provided were very illustrative that the temperature measurements are a desirable / necessary but not sufficient data set for constraining the whereabouts of LNAPL. I am not sure there is an action item, other than the Navy to relax its “we are 100% certain that” position to something more consistent with the data and therefore believable
9. Yes for the organics; for the inorganics, I think the navy agreed they over-played the value of these data in defining flow paths at least without a lot more in-depth analysis.
10. Yes.

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From: TU, LYNDSEY <TU.Lyndsey@epa.gov>

Sent: Wednesday, August 29, 2018 3:29 PM

To: Matt Tonkin <matt@sspa.com>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; G D Beckett <g.d.beckett@aquiver.com>

Cc: Donald Thomas <dthomas@soest.hawaii.edu>; Grange, Gabrielle Fenix <gabrielle.grange@doh.hawaii.gov>

Subject: RE: Next Steps & Coord Calls

Thanks all! I just finished reading through the comments and am getting started on the letter now, I wanted to check with you all about the Navy's follow up actions on our top 10 items. Please review my *very* abbreviated list below and let me know if I am missing something from our discussions:

1. Navy to provide measurements of strike and dip (I believe this already happened?)
2. Will need to be addressed in final model
3. Don T. to provide a paper, Sorrab will look into this
4. LNAPL F&T Model to include conceptual frequency of geologic fast track features and in the flow model these will just be conceptual in the report. Matt to provide tool for lava tubes (MT Provided to EPA)
5. Sorrab will have some conceptual models with high K end for tunnel inflow but not all.
6. MT script of frequencies to sorrab for reference, discuss how we weight the clinker model more (MT provided to EPA)
7. Begin investigation into the use of vapor monitoring points via the existing data to expand understanding of migration of vapor plumes and plan for use of sensors in future response actions
8. None at this time?
9. Post data validation qualified table to be provided by navy with notation of points that they question. Bob W requested that Navy take a closer look at nitrate data

10. SME's need to meet to discuss this further, no specific action

Thanks,

Lyndsey Tu
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Land Division, U.S. EPA Pacific Southwest
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From: Matt Tonkin [<mailto:matt@sspa.com>]
Sent: Wednesday, August 29, 2018 8:08 AM
To: Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; TU, LYNDSEY <Tu.Lyndsey@epa.gov>; G D Beckett <g.d.beckett@aquiver.com>
Cc: Donald Thomas <dthomas@soest.hawaii.edu>; Grange, Gabrielle Fenix <gabrielle.grange@doh.hawaii.gov>
Subject: RE: Next Steps & Coord Calls

I was a bit behind yesterday, for which I apologize.

Attached are my additional comments. I will re-iterate here the "top 10" and then augment with the attached. I have other detailed comments on the documents, but I'm not going to dig in at that level here. I have attempted only to provide my comments that complement those of Bob, Don and Gary and not to re-iterate theirs here.

My main focus is on attempting to make the flow model defensible, and to do that it has to do a better job of reflecting the CSM and then matching the actual data, and to do that the Navy has to incorporate meaningful change into both their CSM and the corresponding model grid, parameterization and calibration so that it stands a reasonable chance of mimicking what conditions the field data indicate prevail.

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From: Whittier, Robert <Robert.Whittier@doh.hawaii.gov>
Sent: Tuesday, August 28, 2018 4:04 PM
To: TU, LYNDSEY <Tu.Lyndsey@epa.gov>; G D Beckett <g.d.beckett@aquiver.com>; Matt Tonkin <matt@sspa.com>
Cc: Donald Thomas <dthomas@soest.hawaii.edu>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>
Subject: Re: Next Steps & Coord Calls

Lyndsey,

To make the COB Tuesday deadline I am forwarding my concerns about the Navy's Red Hill CSM. While not structure to the top 10 or the recent meetings, the attached lays out my concerns. This is a review of the Navy's groundwater flow lines of evidence as listed in Section 6.8 of the CSM report.

My logic is that the criteria for evaluating the Navy's flow and transport model is whether or not it is scientifically defensible. The sub-logic is that if the LOEs are not defensible than any resulting models are likewise not defensible.

Although sometimes people may I do otherwise, I like to keep things simple.

Thanks,

Bob W.

From: TU, LYNDSEY <Tu.Lyndsey@epa.gov>

Sent: Thursday, August 23, 2018 8:41:10 AM

To: G D Beckett; Whittier, Robert; Matt Tonkin

Cc: Donald Thomas; Grange, Gabrielle Fenix

Subject: RE: Next Steps & Coord Calls

Hi All,

I should have followed up earlier this week, but we've been tied up with some senior management briefings. Fenix and I discussed EPA taking the first shot at editing the top ten comments into the body of a letter. For everyone else, I think that the best use of your time is not a highly detailed review of the interim deliverables. Instead, it would be very helpful if you could each relate the follow up actions you heard in response to the topics you individually presented on last week, and or other topics that were raised on the spot last week. I took fairly detailed notes, but there's likely something lost on my part in the technical translation and it would be helpful to get those follow up's from each of you as you heard them. Additionally, if there are other big technical comments related to the Tech memo that you think are important to relay at this time, please include those as well. My preference is that you organize all comments and follow up actions by general categories, such as 'groundwater flow model' 'F&T' etc.

My thought would be to get those follow up items from each of you first, then we will draft a letter and folks will have a chance to give it a look before we send it out. Ideally everyone could get me their take on the Navy's action items and their other comments by EOD Tuesday. I know that Hawaii folks may be hunkered down this week, so let me know if that timeline doesn't work.

I see limited merit in taking on much additional work on our part without understanding what the Navy is able to commit to, so I would think that the follow up call between technical folks should keep that in mind. I can work on setting up a larger follow up call next week once comments are in hand and the letter is (hopefully) drafted.

Feel free to reach out with any questions or comments,

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From: G D Beckett [<mailto:g.d.beckett@aquiver.com>]
Sent: Wednesday, August 22, 2018 5:01 PM
To: Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; Matt Tonkin <matt@sspa.com>
Cc: Donald Thomas <dthomas@soest.hawaii.edu>; Grange, Gabrielle Fenix <gabrielle.grange@doh.hawaii.gov>; TU, LYNDSEY <Tu.Lyndsey@epa.gov>
Subject: Next Steps & Coord Calls

Hello folks,

It seems our nearest task at hand is to compile our CSM comments for the DOH/EPA team to consider in the response letter to the Navy's submittals. Perhaps our recent key concerns memo can be reframed to capture the top ten comments (and a few beyond). As Fenix has noted, we'll keep the comments in the sphere of objective observations regarding how the Navy team's approach might be improved to provide more confidence and conservatism in their conclusions. It would seem we need to get this memo together soon so that the Navy team has at least some chance to respond and modify some of their approaches within their final deliverable timeframes.

Speaking for myself, I have gone over much of the two documents, but there are certainly details that I have not spent a lot of time looking through. I don't know whether spending more time in detailed review will improve my comments much (particularly for the LNAPL F&T), but I also want to make sure that any review comments are fair and sufficiently informed. Others may be in the same boat?

Beyond the comment letter, there are also a number of tasks in-progress and some upcoming that might be pursued. For instance, Matt & Bob have been working with the synoptic data, and there is much still to be learned from that. The groundwater geochem, isotopes, and temperature evaluations hold the potential to better understand the real-world flow regimes around Red Hill Ridge. The list goes on..

I'd suggest a couple calls are in order in the near future. Perhaps the SME team can speak maybe on Friday afternoon (MDT, morning HST) or early next week to get ourselves aligned with comments & potential to-do tasks. That might be followed by a DOH/EPA mgt call to help direct our efforts and to setup the time-lines for the comment letter and any related items.

Best regards

G.D. Beckett, RG, CHg
Principal Hydrogeologist

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